THE

VETERINARY JOURNAL

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Editorials.

OUR PROFESSION.

UNDER the above heading we publish *in extenso* a most interesting paper, read by Dr. David S. White, the President of the American Veterinary Medical Association, before the Wisconsin V.M.A. at their sixth annual meeting early in this year.

It is of particular interest to the members of the British veterinary profession, because it illustrates that our American cousins are passing through a crisis at the present time, and one which they have made themselves for the profession, largely on account of their determination to raise the standard of their matriculation examination and their teaching.

Dr. White goes very thoroughly into his subject, and traces up the progress of veterinary science in America and Canada from the days when it was started by private enterprise and pioneered by such names as Liautard, Andrew Smith and McEachran, until such times as the Universities took it up and veterinary faculties become attached to them.

Then came the question of uniformity of standard and uniformity of lecture courses, and with university matriculation in some schools,

but not in others, the mental standard of the student was a very variable one. The private schools, depending as they did upon the subscriptions of their students, were bitterly opposed to a university matriculation standard, but the American Veterinary Medical Association (which has about 5,000 members), the Bureau of Animal Industry (which employs 1,550 veterinarians), and the U.S.A. Army turned the scale by refusing to recognise graduates other than those from a four years' course college.

The result has been that at the present time, out of the fifteen veterinary teaching institutions in the United States, only two of them are private schools ; all the rest are attached to State institutions or universities. The effect has been to encourage better and more capable men to enter the teaching side of the profession and to stimulate research, but the effect on the numbers of students entering has been, in so far as the consideration of numbers only is concerned, disastrous—but in quality the result must be inexpressibly better, and this higher standard is the one our colleagues in authority mean to uphold and maintain.

Dr. White points out that in 1916 there were twenty-three veterinary schools of North America, with a total of 3,160 students. Now (in 1921) there are fifteen teaching schools (thirteen State and two private) and only 908 students. Attention is drawn to the fact that, owing to the paucity of veterinary students, there is likely to be a shortage of veterinary help for stockowners in the future, and it is interesting to note that the ruling body of the profession in America have recently been passing through a similar stage of discussion as have the Council of the Royal College of Veterinary Surgeons in Great Britain, and on both sides of the Atlantic the decision to uphold a university standard of matriculation has, fortunately, prevailed.

In connection with this one cannot emphasise too much the remarks of Dr. White, and we make no apology for printing them in two places in this issue of the JOURNAL. He says : " As a remedy for this condition (he refers to the comparative paucity of students) some have advised that the entrance requirements to the profession be lowered, again throwing open its portals to anyone rejected in medicine, law or dentistry. It is an old saying that ' a silk purse cannot be made out of a sow's ear.' We are already far enough behind the entrance requirements of the other professions. I do not believe that we can make progress by walking backwards. In the final outcome the matter will adjust itself. If for the next few years the number entering the profession is too small to meet the demand, the public will recognise this fact, and again we shall find the halls of our veterinary institutions well filled."

These are exactly our sentiments, and if we are to hold our place amongst the learned professions we must insist upon a matriculation standard at least on an equality with theirs.

The requirements for entrance to a veterinary school on the Continent of Europe have for a long time been of this standard, and it is gratifying to read in another paragraph of Dr. White's paper that there is a notable increase in the number of veterinary students in France, and Germany. At the present moment Alfort has 222, Lyons 154, and Toulouse 167; whilst Berlin has 410, Hanover 575, Dresden 269, Giessen 202, and Munich 543. *To be retrograde in our preliminary education would be a fatal mistake, socially and pecuniarily.* From the former point of view the general public have no idea of the course of study necessitated before the diploma is obtained, and our social status is entirely what the individual member makes it. Were it classed as belonging to the veterinary profession it would start on a very variable plane.

Pecuniarily we suffer, especially when applying for State appointments, whether public health or even in the army service, because our present standard of matriculation cannot be said to be exactly the same as for human medicine. This state of affairs *must* be altered, and when the standard of the human medical student goes up the standard of the veterinary student *must* go up on an exact equality with it. There must be no argument about that, and if the Council are at all on the waver about it the profession must see that their views are taken by vote before any decision is made which involves in the slightest degree a retrograde step. We commend our readers to peruse Dr. White's paper with care, and we are sure that they will do so with interest.

THE VALUE OF CO-OPERATION AND EXCHANGE.

THE day of the "watertight compartment" has gone, and the time has come when a more intimate understanding must come in the methods to be adopted in the fight against disease. Not only is it necessary for the members of any one profession to pull together, but, in order to get the maximum of success, the different scientific professions (and especially those which are so closely allied as those of veterinary and human medicine) must work in unison. Flesh is flesh, and, whether human or animal, it fulfils a similar groundwork upon which the germs of disease work their ravages, and the sooner this is universally recognised the better for the chances of successful treatment. A recent meeting of the South Wales and Mid-West Veterinary Association afforded a striking illustration of the fact

that both branches of medicine are awaking to the fact that collaboration is helpful. The essayist, Dr. Savage, a medical man, and the Medical Officer of Health for the County of Somersetshire, read a paper on "Bacterial Food Poisons: Where two Professions Meet," and in it he drew attention to the work respectively of the medical man and the veterinarian on the subject of the inspection of the flesh of animals intended or prepared for the food of man, and emphasised that at the present time there was often to be found a kind of "No Man's Land" of considerable importance, but over which neither exercised sufficient or proper supervision.

Throughout his paper Dr. Savage heartily advocated the importance to be gained by working in closer union, and his views were supported in many telling speeches by those who joined in the discussion.

That the subject was a popular one was shown by the enthusiasm which the paper and discussion brought out, and the President and Secretary (Mr. Morgan Scott and Mr. Aveston) are to be congratulated upon the happy thought which brought together such a large gathering and sent everyone home with new ideas to think about, and the opinion that the day had not been wasted.

DISEASES COMMUNICABLE FROM ANIMALS TO MAN.

NUMEROUS diseases are *directly* communicable from animals to man, but in all probability there are quite a large number indirectly transmitted of whose existence we are not yet fully aware.

Veterinary surgeons, to be up to date, must be made aware of these diseases, and on a further page we abstract from the *British Medical Journal* some of the details of interest to us in connection with "Five Cases of Rat-bite Fever," reported by Dr. F. W. Burton-Fanning, M.D., F.R.C.S.

The full report can be read, if desired, in the *British Medical Journal* for June 18, 1921, and we advise our readers to carefully study the extract here published, as, if it does nothing else, it is a further warning of the potential damage which can be done by that most prolific and obnoxious of all vermin—the rat; and it sets one thinking as to whether some of the obscure cases we meet with in sick animals may not proceed from this cause.

A Society* exists for his repression and destruction, and it behoves everyone to assist by every means within their power in the efforts being made to get rid of these pests. Not only can rat-bite fever

* The Vermin Repression Society, 44, Bedford Row, W.C.

be transmitted to man direct from the rat, but, as is shown in the clinical history of Dr. Burton-Fanning's cases, it can be transmitted to man by a kitten, ferret, or some other species of animal who happens to have become infected from a diseased rat.

"GRASS" OR "BORNA" DISEASE.

On a further page we publish a very interesting clinical article by Mr. W. T. Hewetson on the above-named disease which has recently been brought into prominence by the investigations of Professor Gaiger, of the Glasgow Veterinary College, and his enthusiastic assistant and fellow worker Capt. Dalling. If subsequent experience confirms the researches of these gentlemen in their statement that the so-called "Grass Disease" and "Borna Disease" are one and the same thing, then a great step will have been made in veterinary pathological science, and all credit must be given to those to whose originality and painstaking research the credit is due. Then will come the turn of the clinician to do his part and essay a treatment which will effect a cure, for, after all, it is in clinical work that "the greatest good is done for the greatest number," and the laboratory research worker depends upon the clinician to work out and test his theories. Mr. Hewetson has had many years experience of this disease, and in giving the result of this to the profession has indeed pioneered the way and added something worth adding to the structural edifice of veterinary pathological science. It now remains for other practitioners to do their part either by relating their own efforts in the treatment of this fatal disease or by following up the hints given by the pioneers of the subject and recording in their turn the results for the benefit of their fellow-practitioners.

R.A.V.C. OLD COMRADES' ASSOCIATION DINNER.

It has now been decided to hold the first annual dinner (which was postponed in June last owing to the difficulties of railway travelling, to London) on Monday, November 7, at the Holborn Restaurant, 6.30 p.m., the President, Major-General Sir Layton Blenkinsop, K.C.B., D.S.O., in the chair. Tickets, price 7s. 6d. each, can be obtained from the Secretary, R.S.-M. Corr, R.A.V.C. Records Office, Woolwich Common, London, S.E.

More than 100 members have already taken tickets, and the gathering looks like being a representative one. Morning dress will be worn.

General Articles.

OUR PROFESSION.*

By DAVID S. WHITE,
President, American Veterinary Medical Association,
Columbus, Ohio.

WHAT I wish to say to you to-day is in appreciation of the profession which you gentlemen have adopted as your own. I sometimes feel that too few veterinarians are proud enough of their profession. I think, perhaps, there is too much humility and too little pride. This feeling of humility is the child of ignorance and not of knowledge. No profession in this country has developed without a struggle. Whether it be law, medicine or theology, its place in civilisation must be made through a long chain of deeds performed which are helpful to the civilisation in which it exists. Unlike the other professions, that of veterinary medicine was taken up in this country only within comparatively recent years. When our forefathers came across the seas and settled in New England they found a rugged country covered with a dense growth of forest. Out of the forest they were compelled to hew homes and farms in order that they might live. Land in those days might be had for the asking. The livestock interests were obviously nil. The few cattle, sheep and swine they possessed were branded and turned loose in the woods where they multiplied much as in the natural state. Obviously under these conditions there was no particular need for veterinary service. In fact, in those days an able-bodied man who was neither a hewer of wood nor a drawer of water was more of a liability than an asset to the community. It was not until the post-stump stage of pioneer civilisation that our ancestors felt rich enough to afford in a community an individual who did not toil with his hands as they. Feeling the need of the spiritual first a demand arose for ministers of the gospel; later for lawyers for the settlement of disputes, and then for trained physicians who could administer to them in sickness and in injury. It was not until the Indians had been driven back to the far west, towns and villages built and farm lands fenced, which caused the animal owners to keep their stock at home, that any demand arose for specially trained individuals to administer to the ills of animals as the physician did to man. In those early days, as the need developed, there arose in each community a self-appointed animal doctor. He was usually a man of no education, of little knowledge of veterinary art, and seldom equipped with more than a garrulous tongue and a keen desire to escape the drudgery of hard hand toil. Following in his wake there

* A paper read before the Sixth Annual Meeting of the Wisconsin Veterinary Medical Association, held at Madison, Wisconsin, U.S.A., January 18, 1921

came out from the old countries a few men trained in foreign veterinary schools who usually settled in the larger towns soon to enjoy lucrative horse practices. A few of these men, realising that as the country grew in livestock population a demand for veterinary service would grow with it, turned their attention to the training of men to become veterinary doctors. While the earlier attempts were largely failures, a few of them did possess sufficient business acumen to create successful veterinary schools. Most notable of these pioneers were the late Andrew Smith of Toronto, Duncan McEachran of Montreal, and Professor Liautard of New York. Each of these men founded a school. Obviously at this time the curriculum was brief and the entrance requirements the ability to pay the necessary fees. Later one of the great universities of the United States was prevailed upon by Huidekoper of Philadelphia to establish a veterinary department at the University of Pennsylvania. In the meantime some of the land grant colleges, which had been teaching veterinary subjects to agricultural students, branched out in courses leading to veterinary degrees. Most notable of these were Cornell University, the Iowa State Agricultural College and the Ohio State University.

Following the pattern set by Smith, Liautard and McEachran, such men as Hughes, McKillip, both of Chicago, Gill of New York, Stewart of Kansas City, and others, each organised, in conjunction with their respective practices, veterinary schools. As the number of students attending these schools was large, the course of study confined largely to lectures given by resident practitioners and often with little or no compensation and no expensive laboratories to maintain, the experiment of educating veterinarians became a remunerative one. This led to the establishment of still more private schools until in 1916 ten of them existed in the country. Concerning the private schools much debate has always existed. Some members of the profession have been openly critical regarding their existence. However, this much must be said : They did supply the country with a great many good men as among the hordes of students who attended them existed some excellent material. These men made good in the veterinary field, and largely through their efforts veterinary medicine in this country stands where it does to-day.

The state schools, generally speaking, began their work in the most primitive way. Usually an ambitious veterinarian, occupying the chair of veterinary medicine in a land grant college, where he gave instruction to agricultural students, inaugurated a veterinary curriculum leading to a degree. While on paper the course of study looked alluring, in practice the teaching staff was hopelessly undermanned and the buildings and facilities for instruction wholly inade-

quate. In the beginning few students were attracted to these schools. The support of the school came through legislative appropriations, usually given as a lump sum to the land grant colleges as a whole. The money was distributed by the authorities usually on the basis of the " greatest good to the greatest number." As the number of veterinary students was small it received but a scant share of the appropriations. Furthermore, " veterinary science " was looked upon not as a course of study embodying a large number of basic-scientific and professional courses, but as a single subject, like physics or chemistry. This assumption on the part of the authorities naturally held back the development of the veterinary department. It was not until the reorganisation of the Bureau of Animal Industry, which created a sudden demand for a large number of veterinarians for food inspection and animal disease control, and the division of the western prairie ranches into small farms, creating a demand for veterinary service, that large numbers of young men entered the profession. This led to an overcrowding of many of the state-supported veterinary departments. The increase in student numbers had its influence when it came to a division of the appropriations. More men were added to the teaching staffs, buildings were erected, facilities and equipment greatly increased. With the increase in student numbers, and the association with teachers and students in the non-veterinary departments of the land grant college, an influence was exerted to require higher entrance requirements in keeping with those demanded of students entering agriculture, engineering and other courses. This was done in order to procure a better type of students from the standpoint of general education. The impetus given increased entrance requirements originated in the state veterinary schools. Later one of the states by law required that all students entering veterinary schools in that state should be graduates of a high school or its academic equivalent. Obviously private schools were somewhat hostile to this proposition. They depended for their existence entirely upon student fees. To reduce the number of students, which higher entrance requirements would produce, was inimical to their interests.

Following the lead of the American Medical Association, the American Veterinary Medical Association, after a canvass of the situation, lent its influence to higher entrance requirements. This was followed by the Bureau of Animal Industry and by a few of the state examining boards. One result of requiring higher general education of the veterinary matriculant has been to reduce greatly student numbers, especially in the more poorly equipped schools. Generally speaking, the better educated the matriculant, the more discerning and demanding he is in regard to teachers, facilities and equipment.

To-day all of the veterinary schools of the United States and Canada require a minimum of four years of high school training, or its academic equivalent, and beginning January, 1921, the same preliminary education is required of veterinarians who enter the service of the Bureau of Animal Industry. I do not mean to state that the reduction in the number of veterinary students in North America is entirely due to increased entrance requirements. There are other factors which undoubtedly bear upon this matter, but in our opinion the principal one is the higher educational qualification demanded of the matriculant at the present time.

The veterinary profession of the United States, despite its youth and its origin from an educational standpoint, has made a record to be proud of. No country in the world can boast of a mechanism so well organised and equipped to combat disease outbreaks as is afforded by our National Bureau of Animal Industry. This Bureau has in its employ 4,673 persons, of whom 1,550 are veterinarians. While busy with hog-cholera control in 34 states, tuberculosis eradication in 43 states, tick eradication in 10 states, scabies, anthrax, dourine and stockyard inspection in 36 states, virus-serum control in 12 states, quarantine inspection in 9 states, and meat inspection in 46 states, it has found time to organise a plan of preparedness so well conceived that any invasion of any foreign communicable disease of animals may be combated with great assurance of success. Nowhere in the world have the veterinarians, under their own control, as large, inclusive and efficient an organisation as our Bureau of Animal Industry. In my travels in other lands I noted the envy in which this organisation was held by my foreign colleagues.

In most of the states there now exist fairly adequate systems of veterinary police. Unfortunately the efficiency of many of these organisations is subject to political interference. The appointment of a state veterinarian, for instance, by the governor is unfortunate. His office should be one of continuous administration. Changing each two years the policy of the state veterinarian's office and the displacement of many of the technical employees of this office do not augur for the best interests of either the veterinary profession or the people of the state concerned.

A decided change for the better has occurred in the Veterinary Service of the United States Army since the close of the war. The National Defence Act of 1916, while it gave to the veterinarian the rank of a commissioned officer, was so loosely drawn, in so far as it applied to the veterinary service, that the status of the veterinarian was susceptible to more than one interpretation. It furthermore created no organisation of the veterinary service, and tended to crush,

rather than promote, administrative ability in veterinary officers. The result was that when the United States entered the Great War an entirely new, and for our people untried, system had to be inaugurated. In place of a small, well organised and equipped veterinary corps, which could form the nucleus of a larger organisation in case of war, there existed only a handful of unorganised regimental officers just commissioned, though many of them had seen years of service, who could not take the initiative required to create an efficient veterinary service for an army of four millions of men. This led to civilians of administrative experience being in many instances placed over the regular. That resentment should result from this unbusiness-like but necessary procedure is obvious. Largely through the influence of our National Association, Congress was prevailed upon to give the veterinarian a definite status in the army and to accord him more adequate rank. While the Army Reorganisation Bill of 1919 falls far short of granting to the veterinarian full authority to do his own job, it is nevertheless a great step in advance and one which may from time to time be amended by subsequent legislation.

In addition to the veterinary schools and police organisations there have grown up in this country a large number of veterinary associations designed to uplift the profession. Most of these organisations are alive and progressive. A new profession, as is ours, is not afflicted with traditions which tend to hold it back. Therefore, once an association begins showing signs of disease it is not long before its requiem is being sung. Our National Association, which now numbers approximately 5,000 members, is numerically the largest organisation of its kind in the world. Its influence upon veterinary education has already been felt. Its policies and politics, however, have not yet fully been determined. Like many organisations of its type, it has been somewhat self-engrossed and more interested in its internal affairs and politics than it has in the good its organised effort could bring to the profession at large and to the public. However, it has outgrown its swaddling clothes, has thrown away its stick of candy, and is rapidly developing into a red-blooded manhood, whose influence upon the profession and the public will be felt. As a matter of detail may be mentioned the desire of this Association to procure for itself a permanent home from which its business may be transacted and in which its records may be securely housed, and a permanent secretary whose sole business shall be the administration of its business. It takes time and brains to perfect an organisation which is to be efficient. Like the farmer, the veterinarian has been difficult to organise. The majority of the rank and file are busy practitioners, each a little king in his own realm. He feels his independence, perhaps, too keenly,

is too often self-satisfied, and fails to recognise that sometimes by surrendering a part of his time, money and brain-power he can develop something which will later pay to him handsome returns on his investment.

I presume many of you here to-night have been thinking about the future of the veterinary profession. Since the advent of the automotive vehicle a good deal of alarm has been created in the ranks of the profession. Some of us have hypnotised ourselves into believing that the profession is now a derelict, a mere wreck on the beach. Admittedly the automotive vehicle has led to a reduction in the number and a change in the distribution of horses and mules. This has been felt particularly in the large cities. Veterinarians who formerly enjoyed lucrative horse practices have found themselves bereft of an income derived almost entirely from the horse. While some of the more discerning ones were awake to the situation early enough to adapt themselves to the change, not a few surrendered to what seemed the inevitable and left the profession for other fields. On the other hand, small animal practice in the cities has tremendously increased in the past 20 years. While 25 years ago one cage in the small animal ward of the Ohio State University was ample to encoffin the occasional canine or feline patient, to-day we find 125 cages insufficient. Furthermore, the value of the average small animal patient is a sentimental one, thus placing it in a category more nearly approaching that of the human patient.

Since 1867 in the rural sections milch cows have increased from 8,394,000 at $29 each to 23,467,000 at $79 each in 1919. Other cattle increased in the same period from 11,713,000 at $16 each to 44,399,000 at $45 each. Sheep from 39,385,000 at $2·50 per head to 49,863,000 at $12 per head. Swine from 24,694,000 at $4 per head to 75,587,000 at $22 per head. These statistics show that all kinds of livestock have increased greatly in numbers and value since the Civil War, keeping pace with the increase in population. The only exception is the horse, which has actually decreased in numbers and fallen off in price. In 1867 there were 5,401,000 valued at $59 per head, and 822,000 mules at $67 per head. Personally I do not believe any of us will see the time when, as predicted by some, the horse will become as great a curiosity as the giraffe or other rare circus animal. For the horse of proper type of the heavier breeds there is an excellent future. To-day for each colt born in the United States three adult horses are taken from the supply and put to work. In the last decade no marked improvement has been made in the automotive vehicle. The Ford of 1910 in motor and chassis design is very much like its 1920 descendants. No radical departure from this

design seems contemplated. Farmers are finding the tractor a valuable supplement to the horse on farms adapted to its use. On the other hand it has been found that even where the tractor can be used economically from other standpoints it rarely displaces enough horses to " pay for its keep."

Admitting that the veterinary profession is now in a transitional stage, endeavouring to adjust itself to new conditions made complex by the fact that we are in the wake of a great war, when we realise what the profession has done for the people of the country in the past we must assume that its task is by no means finished, and that we really stand on the brink of still greater opportunities. The livestock industry of the United States represents an investment of approximately 10 billion of dollars. Annually three hundred millions of dollars are lost to this industry through animal disease. As the population increases the problem of feeding the masses grows ever greater. To meet this problem a more intensified type of agriculture must be undertaken. While in the early days thousands upon thousands of cattle roamed the unfenced ranges of the West the cost of producing beef was a minimum one, with the fencing of the open ranges and their division into smaller farms, coupled with the introduction of irrigation, land values have so greatly increased that the old method of raising cattle has been abandoned. The production of beef on high-priced land is a much more expensive proposition which adds greatly to the value of each animal produced. What applies to cattle applies equally well to horses, sheep, swine and poultry. In the future we may look for a greater production of better bred animals and higher priced ones, for under a system of intensive agriculture only those animals will be retained which pay for their keep. The veterinarian of the future, in my opinion, will find veterinary practice, which now includes all domesticated animals, even poultry, more stable in its remuneration than ever before. In this connection, and as evidence that this view is not shared by the masses, permit me to draw your attention to the student population of the veterinary schools of North America.

The tabulation shows 908 students matriculated in the fall of 1920 in the fifteen veterinary schools which include two private institutions, one of which is no longer accredited by the A.V.M.A. Of these 185 were freshmen. In the then existing twenty-three veterinary schools in North America in 1916 there were 3,160 students.

While, as noted, the higher entrance requirements are probably the principal factor in producing this marked decline in attendance, undoubtedly there are other factors. Briefly some of them are the complaints of once prosperous veterinarians who have lost their city

STATE VETERINARY COLLEGES 1920-1921.

Name of Institution.	First Year.	Second Year.	Third Year.	Fourth Year.	Special.	Totals.
Alabama Polytechnic Institute	20	15	12	6	...	53
Colorado Agricultural College	26	22	20	20	...	88
Georgia State Agricultural College ...	7	7	3	4	...	21
Iowa State Agricultural College ...	30	24	18	22	...	94
Kansas State Agricultural College ...	9	20	13	18	1	61
Michigan Agricultural College	1	8	4	8	...	21
New York State Veterinary Coll. (Cornell)	13	32	15	16	2	78
New York State Veterinary College (N.Y. University) ...	7	3	5	8	...	23
Ohio State University	19	30	30	25	...	104
Ontario Vet. College (Toronto, Canada)...	24	32	22	17	...	95
University of Pennsylvania	4	8	7	11	...	30
Texas Agricultural and Mechanical Coll.	1	5	2	6	4	18
State College of Washington	3	1	6	12	...	22

PRIVATE VETERINARY COLLEGES 1920-1921.

Indiana Veterinary College	11	28	23	73	1	136
St. Joseph Veterinary College	10	38	16	37	...	100

horse practices ; the low salaries paid the veterinarians in the Bureau of Animal Industry ; the poverty of many municipalities which have outgrown their ability to raise enough taxes to support themselves adequately ; the swollen wages of to-day, and the popular belief that since the production of automotive vehicles there is no further

need for the veterinarian. As a remedy for this condition some have advised that the entrance requirements to the profession be lowered, again throwing open its portals to anyone rejected by medicine, law or dentistry. It is an old saying that "a silk purse cannot be made out of a sow's ear." We are already far enough behind the entrance requirements of the other professions. I do not believe that we can make progress by walking backwards. In the final outcome the matter will adjust itself. If for the next few years the number entering the profession is too small to meet the demand, the public will recognise this fact and again we will find the halls of our veterinary institutions of learning filled. There has been notable increase in the number of veterinary students in France and Germany. The figures are: Alfort 222, Lyons 154, and Toulouse 167; Berlin 410, Hanover 575, Dresden 269, Giessen 202, Munich 243. The requirements for admission to a veterinary school on the Continent are practically equivalent to two years of arts college work in this country.

We believe a partial solution of the problem is to strengthen our schools by greater appropriations to procure better teachers, more adequate facilities and equipment. The livestock owners of the United States will demand that some group of men administer to the sick and injured animals which they possess and advise them against anything which is a menace to these animals in health. If the veterinary profession is not competent to do the job some other group of persons will and must. But I do not believe that, as a profession, we are willing to quit the job. Our past achievements are known to the wide awake livestockman. He is our best friend and counsellor. When we think of the great animal plagues which our profession has either kept out of the country or controlled or eradicated, once they got in, we have much to be proud of. The rinderpest has never visited us. Sheep pox has never existed among us. Surra has been kept out. Despite its remarkable versatility in its effort to gain a foothold on the American Continent that dreaded immigrant foot-and-mouth disease has each time been accorded such an inhospitable reception that its future under the American flag seems very dark. Those of you who remember the last epizoötic of this plague know well the trials and tribulations of our profession in its effort to perform its duty. With Congress, state legislatures, governors, and influential citizens, some of them members of our own profession, on our backs, in the language of football, the veterinary line held. While for a time they were on our two yard line and bucking hard, nevertheless we held for "downs," the ball was passed over, and we punted out of danger. With the disease in twenty-two states, covering an enormous territory greater than that of all Europe and Great Britain combined,

the veterinary profession forced the plague to evacuate our shores. With southern cattle fever, despite much opposition, the veterinary profession continues to crowd southward, the quarantine line extending from the Atlantic to the Pacific. It needs no great stretch of imagination to see the last of the cattle ticks drowned in the Gulf of Mexico. After much misrepresentation, the use of tuberculin as the most important factor in the eradication of tuberculosis of cattle has been generally accepted by the public. The great white plague is gradually receding, and while in our time it may never be entirely wiped out, we may look forward with confidence to a system of control which will cause it to become negligible. Hog-cholera we now know how to control. Through the discriminating and skilful use of serum-virus on healthy herds hog-cholera has ceased to be a problem from a veterinary standpoint. Once the public is educated to the point of co-operation this disease will join the "used-to-have-its." With glanders, rabies, dourine and the various skin diseases caused by mites, veterinary control is becoming yearly more manifest. The most serious problem, and the one against which we have made the least progress, is the abortion disease of cattle. But of this we do not despair. Our history shows that we have in time licked every plague which confronted us. We are of the firm belief that history will repeat itself in this regard. All our profession needs to-day is to await the development of more men of the best type. Some of these are already decorated with a veterinary degree, but still young, and awaiting the golden opportunity to make a place for themselves in the profession. Some are in the schools; others will enter the profession once they realise its importance to the nation and the service which they, through it, can render to mankind. No veterinarian, who has knowledge of the accomplishments of his profession, need feel the sting of humiliation. Rather should he feel the inspiration of a pride, the product of a devotion to a duty well performed. Whether it be in the field of practice, in national, state or municipal veterinary police work, in research, in teaching or in the army, experience has taught us that once given the authority to do his own job the veterinarian has always made good.

It should be part of the business of every veterinarian to create about him an atmosphere of optimism concerning his profession. He should affiliate himself with local, state and national associations, and do so with more of the spirit of what he can put into these things than what he can get out of them. Shortsightedness has brought too many of us to professional ruin. Farsightedness is the keynote of professional success. Let us as a profession present a united front. Let the slogan be less knocking, more boosting. Numerically we are

the smallest of the learned professions. We cannot, therefore, afford to allow our house to become divided against itself. Our greatest asset is our knowledge of things of which other men know little or nothing. Without bombast or brag let the people know what our mission is and that we are prepared to carry it into effect. In biblical language "let your light so shine before men that they may see your good works." —*Proceedings of the Wisconsin Veterinary Medical Association.*

FIVE CASES OF RAT-BITE FEVER.*

Two Cases Treated Successfully by Novarsenobillon.

By F. W. BURTON-FANNING, M.D.Camb., F.R.C.P.,
Honorary Physician to the Norfolk and Norwich Hospital.

Judging from my experience, I am inclined to think that this remarkable disease is not so rare as is generally supposed. It has been well recognised in Japan since 1899, and some 40 cases have been recorded there. But it was not until 1910 that Sir T. J. Horder* published an account of three cases of rat-bite fever, stating that they were "instances of a disease hitherto undescribed, at least in this country." Since then single cases have been recorded by Dr. G. S. Middleton,† by Dr. R. W. Cruickshank,‡ by Dr. J. O'Carroll,‖ by Professor R. Tanner Hewlett and Dr. G. H. Rodman,§ by Dr. F. Nicholson,** and by Dr. J. H. Nixon.†† Dr. A. G. Atkinson‡‡ had one case under his own observation, and collected the particulars of five other cases, which he published for the first time, together with an excellent account of what is known about this disease.

Since 1897 I have seen five patients suffering from rat-bite fever, all of whom came from different parts of Norfolk. In addition, I have been told of a few other cases, some of which at least were probably instances of the same disease.

The mortality of rat-bite fever in Japan is stated to be 10 per cent.

The fifteen published cases in Great Britain and my own five cases all eventually recovered. It has been noted as one of the features of the malady, as seen in this country, that there is tendency to its spontaneous subsidence, but its course may be a very long one and the patients are usually gravely ill. In different cases the duration has

* Abstract of an article in the *British Medical Journal*, June 18, 1921.
* *Quarterly Journal of Medicine*, 1910.
† *Lancet*, 1910.
‡ *British Medical Journal*, 1912.
‖ *Dublin Journal of Medical Science*, 1912.
§ *Practitioner*, 1913.
** *Practitioner*, 1913.
†† *British Medical Journal*, 1914.
‡‡ *Medical Chronicle*, 1913.

varied between a few months and as many years. Until recently it was agreed that no treatment was of any avail. The periodic attacks of fever have led to the trial of large doses of quinine, but this and a number of other drugs—including atoxyl—have been found useless. Now, however, we have information on the organism which causes the disease, and the last two patients had the benefit of a rational method of treatment which promises to be a cure.

Many different micro-organisms had been found in the past by some observers, and their presence refuted by others. Horder's cases were thoroughly investigated, but with negative results. From two of my patients the blood, and fluid from puncture of inflamed skin in one, have been examined by Dr. G. P. C. Claridge, but he found no organism, and there was no growth on culture media. Other observers have also agreed that there was nothing to be found in the blood or elsewhere.

I am indebted to Dr. Atkinson for having my attention called to a publication by Mr. A. G. R. Foulerton,* describing *Spirochaeta morsus muris*. This organism has been found by Japanese investigators "in the blood of one out of forty-three apparently healthy house rats examined. Inoculation of a white mouse with the blood of this rat was followed by an infection identical with that produced by inoculation with material from human cases." The negative results obtained by ordinary examination and by culture of the patients' blood are explained, for the demonstration of the spirochaete by direct examination is stated to be difficult. But if white mice are inoculated with the blood, or with exudation from the skin, or with liquid from the affected glands of a human patient suffering from rat-bite fever, the spirochaete can be demonstrated in the mouse's blood. Mr. Foulerton kindly undertook to make some inoculation experiments with the blood of Case III. Six guinea-pigs were inoculated with blood drawn during two bouts of fever, four of the animals have remained quite well, and in none of them have any spirochaetes been detected. Mr. Foulerton writes: "But the clinical evidence leaves no doubt whatever as to the nature of the case, and it appears that others have found the experimental confirmation, by inoculation with patient's blood, somewhat uncertain of result."

Before this spirochaete had been identified as the cause of rat-bite fever its treatment with salvarsan had been advocated by S. Hata.† He used salvarsan in eight cases. Five were immediately cured, a sixth case was benefited, and the remaining two cases improved temporarily, but relapsed later. In regard, however, to these last two

* *Journal Pathology and Bacteriology*, 1919.
† Epitome, *British Medical Journal*, 1912.

cases, the author explains that they did not receive a large enough dose. In Case I of mine an intravenous injection of novarsenobillon 0·45 gram was given by Dr. Claridge. As will be seen from the chart an immediate effect was produced, and for the next five weeks the patient had no recurrence of the febrile attacks. Moreover, all the local inflammatory manifestations at once began to clear up, and his general condition to improve markedly. So he returned home to complete his convalescence. Five weeks later it appeared, however, that he was not quite cured. There occurred a rise of temperature to 101·4° and a transient erythema on the limbs. Dr. G. C. Gaynor, under whose care he was at home, gave him a second intravenous injection of novarsenobillon 0·6 gram, and the temperature remained normal for the next seven weeks, while he continued to regain weight and strength and was able to resume work. Two more similar doses were given at intervals of two and three weeks, as the temperature again rose on single occasions to 100°, with reappearance of the rash. Three months after his first dose, which was followed by subsequent injections at irregular intervals, the patient appears finally cured and has regained twenty-two pounds of weight.

In Case III the first injection of novarsenobillon was followed by a similar abrupt cessation of fever. Three more doses were given at regular intervals of a week, but from the time of the first injection he made an uninterrupted recovery as regards every feature of his illness.

If a conclusion may be come to from the experience of these two cases, I would say that a single dose of novarsenobillon puts a stop to the recurring attacks of high fever, and reduces all the inflammatory affections of lymphatics and skin. But, as in the case of *Spirochaeta pallida*, the injection must be repeated at regular intervals of a week to complete the cure.

I will give briefly the notes of three of the patients :—

CASE I.

I. H. B., aged 54, was admitted into the Norfolk and Norwich Hospital, under my colleague Dr. A. J. Cleveland, who was kind enough to transfer him to me for the purpose of this communication. He had never been ill previously. On October 3, 1920, while rat-catching, he was bitten on the left index finger by a ferret which had killed and partly eaten several rats. There were four small punctures on the finger which quickly healed, and never showed at all after the first few days. On October 15 he began to feel ill, and the left axillary glands enlarged. A few days later he was seen by Dr. Gaynor, who noted lymphangitis and lymphadenitis of the left arm, with areas of inflamed skin in other parts, and attacks of fever every few days.

On October 25, on admission to hospital, the patient was obviously very ill; he had a muddy complexion, and was heavy and prostrate. On examination the striking feature was lymphangitis. This could not be traced directly from the bitten finger, but was most marked over both shoulders. Coursing from the tops of each shoulder, over their anterior aspects to the axillae, were three or four parallel red lines. These could be seen and felt to be of about the thickness of the stem of a clinical thermometer. The glands in the right axilla were less enlarged than those in the left axilla, but the lymphangitis was equally marked on the two sides, and less obtrusive affection of the vessels was seen in both arms. Another phenomenon was the occurrence of circular patches of erythema on the forehead, the face, the chest, the upper abdomen, and the forearms. The larger of these were about an inch in diameter; they were red in colour, with a yellowish inner ring. Some were so prominent and swollen as to suggest the presence of pus. With each febrile attack these inflammatory affections of the lymphatics and of the skin would become aggravated and fresh lesions would appear. My patient had a little diarrhœa for a few days, and during each attack of fever he complained also of much soreness and dryness of the throat, where some congestion was apparent.

For the first three weeks of the illness he had epididymitis of moderate degree on the left side, which gave him some pain during its existence, but which subsided readily while the other symptoms were at their height. This is a complication which I have not found recorded by others, but it is interesting to read in Foulerton's paper that on post-mortem examination of a patient in Japan there was found a single spirochaete in the testicle, while numbers were found in the kidneys and suprarenal glands.

CASE II.

W. A., aged 49, was admitted under my care into the Norfolk and Norwich Hospital on December 11, 1897. He had always lived in Acle, which stands in the centre of a district known for its rivers, broads and marshes, and where *Anopheles maculipennis* is still constantly found. At the age of 10 he had ague, but no mention is made in the notes of recurrence. Nine weeks before coming under my care he had been bitten by a rat in the palm below the right wrist. A local abscess formed, and there was lymphangitis up the arm. An incision had been made, but the skin remained red and indurated. Lymphangitis of the right arm and forearm was the conspicuous condition, but he also had patches of erythema on the other arm. He had paroxysms of fever, shivering and sweating at intervals of from two to four days, along with which it is recorded that the inflammation

in the arms increased. Dyspeptic symptoms with frequent vomiting occurred during the whole illness. It was particularly recorded in the notes that quinine in doses up to twenty grains failed to avert the attacks of fever, the last of which occurred fifteen weeks after the bite. Many examinations of his blood were made by Dr. S. H. Long, who at length found a few malarial plasmodia. This finding was confirmed by Professor Nuttall, who saw the slide, which is still in Dr. Long's possession.

CASE III.

S. H., aged 38, admitted into the Norfolk and Norwich Hospital on March 14, 1921, was bitten by a rat on February 15, and the small wound on the right thumb healed rapidly under local treatment. About twelve days later there were pain and tenderness at the site of the bite, which increased during the next few days and then extended up the forearm to the axilla. On March 3 the thumb was incised by his doctor, but no pus was found. Headache, sleeplessness, and slight sore throat, with increasing feverishness, were complained of, and he was sent to the hospital. There he presented the aspect of acute illness, with flushed face and injected conjunctivae. The surface of the body, of the face, and of the limbs was covered with an extensive papular rash. This was darkish red in colour and with each attack of fever the papules enlarged and fresh ones appeared. The spleen was just palpable and remained slightly enlarged during the illness. On the palmar surface of the right thumb was a sore as large as a florin; this was covered by a yellow slough and surrounded by red skin. There was marked lymphangitis from the thumb up the forearm and the axillary glands on the right side were enlarged and painful.

A blood count showed 11,100 white cells and no eosinophilia. The attacks of fever are represented in the accompanying chart. As these came on the patient complained of severe headache, he felt cold, then followed profuse sweating and occasional vomiting. On one night he was delirious with the fever.

Without recounting my cases at greater length, I would say that the points of rat-bite fever are as follows:—The illness is caused by the bite of a rat, or, as in one of my cases and in one of Atkinson's, by the bite of a ferret, or, as in another of his, by the bite of a kitten —all these animals having just bitten the body of a rat.

Rat-bite fever is a serious illness, as testified to by a medical man who himself suffered from it in 1896. He was seen by several eminent doctors, and thought then to have some form of blood-poisoning. Dr. G. Master's case is now included in Dr. Atkinson's account of rat-bite fever, and he writes to me:—

"I was away from work for seven months and did not feel fit

for eighteen months after the start of my illness. The wasting was extreme ; I could make my two hands meet round my waist, and at one time I could not turn myself in bed. Treatment did not seem to help in any way."

It now appears that rat-bite fever can be added to the list of diseases for which the cause and the efficient remedy have been found.

Clinical.

EVERSION OF THE BLADDER IN THE MARE DURING PARTURITION.

By R. HUDSON, F.R.C.V.S.
Retford.

Two cases of this rare condition have occurred in my practice this summer on adjoining farms, and at about the same time.

In the first case the mare—a six-year-old Shire—was prepared for foaling. She was found " in pains," and soon put out what the owner and foreman thought to be the " fleb." Following the usual custom the foreman made an incision seven or eight inches long, but no waters escaped, and as they could see something inside I was called in. On arrival I found the mare lying down, quiet, and only straining slightly at long intervals. Hanging from the vagina was a spherical mass, tense as a blown-up football, which was easily recognised as the urinary bladder. Through the incision made by the foreman I could see that it was packed full with small intestine, held from escaping by shreds of bladder wall which had not been cut. The whole mass was soiled with fæces and bedding, some of which lay among the intestines. The foal was found to be dead, and, the case being regarded as hopeless, I had the mare destroyed.

The second case also occurred in a Shire mare. She had commenced to foal, but the act was delayed owing to the foal's fore-legs being flexed at the knees and below the pelvis. The urinary bladder was completely everted, but did not contain any intestine, and was not so tense as in the other mare. The mare was in great distress, being bathed in perspiration, walking round the box and throwing herself down, straining when both up and down with great violence. A twitch was applied, the everted bladder washed, dressed freely with lard, and replaced without much difficulty by working from the neck to the fundus. Fearing eversion, pressure was applied to the neck of the bladder with one hand and an attempt made to raise the forelegs with the other, but the mare strained so violently that the bladder was again forced out, and also the rectum for about four inches.

Pains came on with such violence and rapidity that the mare was difficult to restrain, and it was evident that she would injure herself if she could not be narcotised quickly. Fortunately I had taken the chloroform muzzle with me. It was put on, the mare being held to the manger ring by a rope run through without tying. Three ounces of chloroform were put in, and in a few minutes the mare began to reel about and went down. Replacement of the bladder was again attempted, and although more difficulty was experienced than in the first instance, it was eventually replaced, the foal's legs straightened, and the foal delivered. During the operation a few pains were felt, but they were too feeble to interfere with the replacement of the bladder or the raising of the legs. When the foal was delivered the mare looked like collapsing, her breathing becoming very shallow, but the muzzle having been removed during the act of withdrawing the foal, her tongue was pulled out to enable her to breathe more freely, and after rather an anxious time her respirations became more normal. The mare was given a mild dose of physic and salines, no treatment of the bladder being attempted. On the following day she was well rugged and placed out in a paddock, being brought in at night. She made a good recovery. Her urine was muddy for about ten days after.

These two cases, although showing the same condition, were very unlike in the way they behaved. Had it not been for the injury to the bladder and the presence of intestines in its interior, the first case would have been an easy subject for treatment, but the second, I feel sure, would have been hopeless without the help of chloroform.

GRASS DISEASE.

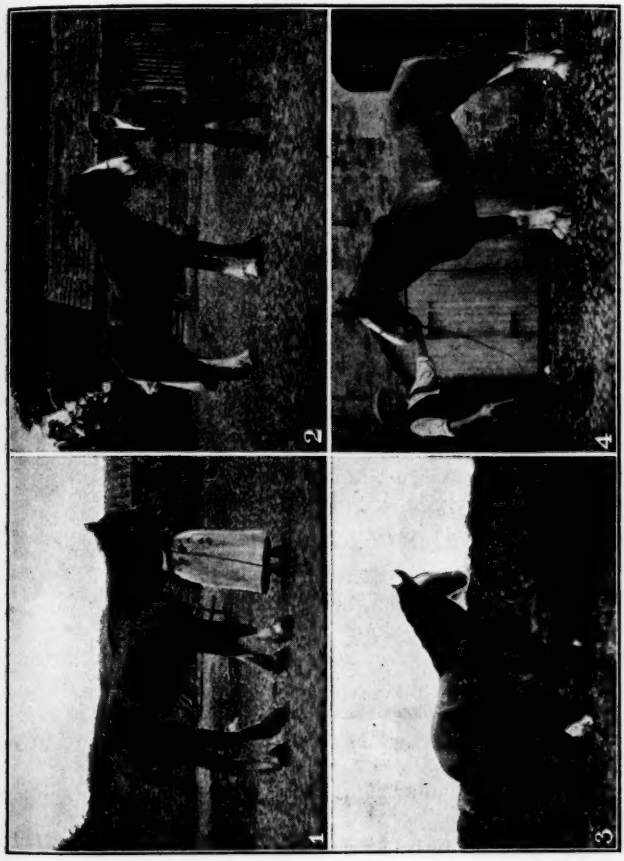
With Photographs of Horses that are Suffering from Paralysis of the Single Colon or have had Paralysis.

By W. T. Hewetson, M.R.C.V.S.,
Brampton, Cumberland.

Photograph No. 1 has just commenced with the complaint; No. 2 has undergone a month's treatment, and has been a fortnight again on grass; No. 3, the horse standing in front, underwent the treatment last year; No. 4 this year.

In this complaint the most critical time, and the time when the case needs the most attention is at the commencement of the treatment. It is very important to get the bowels opened as soon as possible, and it is somewhat difficult to gauge or regulate the precise dose of medicine necessary to do this. When the bowels are made loose there is no necessity to repeat the physic. The laxative diet will accomplish the rest. That is, it will keep the bowels open and rid the system of the poison absorbed and the poison still retained

in the bowel. Repeated physicking, or over physicking, has a very bad effect on the heart, which is already affected by the poison generated by the retention and the composition of the ingesta. The horse, if not properly treated, dies from heart failure.



No. 1.—Horse just commencing with "Grass Disease." No. 2.—Horse recovering after a fortnight's treatment and a fortnight at grass. No. 3.—This horse underwent the treatment last year. No. 4.—Underwent treatment this year and recovered.

I have observed, when the fingers are placed in the mouth of the affected horse, a quantity of saliva runs out; the patient will then require a larger dose of medicine to physic him or open his bowels. He should at the same time receive a stimulating ball containing ammon. carb. and nux vomica pulv. This helps the physic to operate.

If the horse should be taken ill on grass away from home, and it should be necessary to take him home, the patient should have the opening medicine before walking him any distance.

Recently I had the misfortune to lose a horse. The owner had a grass park taken four or five miles away from his home. In this park he had a two-year-old Clyandale mare taken ill with the complaint. I saw her in the park and gave her the opening medicine, and as there was not any accommodation or loose box to put her in, she was walked home. The mare's bowels had responded to the physic next day. This mare recovered. About a week later the same owner had another mare taken ill in the same field. He first walked this mare home, and then sent for me to attend. On examining this second case I did not consider it any worse than the first. The pulse, I thought, was stronger and not so quick. A 6-dram physic ball was given and I saw the patient next day, but to my disappointment she had not passed any fæces. A pint of linseed oil was now given, and injections of soap and water given as enemata periodically during the day.

With the first injection a few pellets of dung came away coated with mucus. The mare was visited twice a day. The pulse became weaker and weaker and faster. To an ordinary observer the patient did not appear to be any worse. She died on the fifth day after receiving physic, diffusable and nerve stimulants and injections of soap and water per rectum. All failed to open the bowels. I attributed this to walking the mare four or five miles without first giving the physic. The day she walked home was very hot and she would loose a considerable amount of perspiration which would tend to make her bowels more costive. Had the physic operated this mare would have recovered under the treatment previously described, viz., soft food only, and no other food allowed for one month. In this food a teaspoonful of pulv. nux vomica to be given once or twice daily. On no account must grass or hay or any food be given. The food should have put into it a handful of common salt; the box bedded with sawdust or moss litter so that the patient cannot eat the bedding. One of the chief articles of diet should be *boiled barley* in any form, linseed, milk, boiled oatmeal, boiled turnips—of this he should receive three bucketfuls a day. Allow chilled water to drink, and if he does not care for water give him as much salt as he will take in his food to induce him to drink. The patient should be sheeted to make him comfortable, and under this simple treatment the patient will recover.

No. 2 and No. 3 photographs of the horse had the same appearance as the photograph No. 1 when suffering from the complaint.

[Mr. Hewetson has also made valuable contributions on this complaint on pp. 168, 169, 170 and 171, "V.J." for November, 1920, and pp. 66, 67, 68, 69, "V.J.," February, 1921.—SUB-EDITOR.]

A NOTE ON THE IMPORTANCE OF THE GENUS "HABRONEMA" AS AN ECONOMIC FACTOR AMONGST THE EQUIDÆ OF THE PUNJAB AND THE NORTH-WEST FRONTIER PROVINCE.

BY E. SEWELL, M.C., M.R.C.V.S.,
Post Graduate Professor, Punjab Veterinary College.

IN Fleming's translation of Neumann's Parasitology, "Spiroptera," or, to give them their more modern name, "Habronema," are stated to have slight, if any, pathogenic significance. Anyone who has had experience of the condition and has seen the large suppurating tumours produced by *H. Megastoma* in the pyloric region of the stomach, and the occasional ulceration, inflammation, and congestion caused by *H. Muscæ* and *H. Microstoma* in the cardiac portions of that organ, knows that this statement is utterly at variance with the facts of the case.

This disease in recent years has received a certain amount of attention in Australia and America, and is rightly blamed as being the cause of much loss in both countries.

During the past year the writer has had many opportunities of examining the stomachs of horses and mules which have been destroyed for chronic debility from various stations and remount depots in the Punjab and the North-West Frontier Province.

In every case the stomach was the seat of serious lesions due to the ravages of one or all species of the *Habronema.*

In one case the writer was asked to give his opinion as to the persistent debility shown by a batch of fifty Tibetan mules. The R.A.V.C. authorities concerned kindly placed several old debilitated cases at his disposal. Post-mortems proved that in every case the condition was due to Habronemiasis.

The condition may be recognised by the tumours of various sizes in the case of *H. Megastoma*, and by the large numbers of tiny thread-like worms lying on the mucous membrane of the cardiac portion of the stomach in the case of *H. Muscæ* and *H. Microstoma.*

These are more easily seen if the ingesta is removed from the stomach and the organ placed in a vessel of water, when the parasites can be readily seen floating throughout the liquid.

The life-history of the parasites has been worked out by Bull, Van Sacegham and others, and is briefly as follows:—

The eggs produced by the female *Habronema* pass out in the fæces and are ingested by the fly maggot. These eventually make

their way to the thorax and proboscis of the mature fly, and it is supposed that the horse, by ingesting infected flies either in his food or drinking water, infects himself, and thus completes the cycle. *H. Muscæ* and *H. Megastoma* have as their intermediate host the common house fly—*Musca domestica*, whilst *H. Microstoma* develops in the stable fly—*Stomoxys irritans*.

The fly can only become infected as a larva, not as a nymph.

The adult *H. Megastoma* is found enclosed in tumours and seems for preference to select as a site the pyloric portion of the stomach although the lesions may be found in any part of the organ.

These tumours are generally conical in shape, and vary in size from that of a small pea to that of a hen's egg. The tumour is usually full of hard inspissated pus, and a number of worms can generally be seen protruding from a small opening at the apex of the cone and waving in the lumen of the stomach. In some cases there is no opening. It can readily be understood that the portion of the stomach thus affected ceases to function. This species is the most harmful of the *Habronema*.

H. Microstoma and *H. Muscæ* lie loose on the mucous membrane of the cardiac portion of the stomach, and may cause an acute inflammation and congestion. They do not seem to affect the pyloric portion of the organ. *H. Muscæ* is probably the least harmful of the three species.

Lewis and Seddon, Bull and Van Sacegham, have proved that the disease known as "Habronemic Granuloma" is caused by the larvæ of these parasites, *H. Microstoma*, in all probability, being the species chiefly concerned. The condition known in India as "Bursatee," and believed by Lingard to be due to Filariasis, is probably due to the larvæ of the Habronema. When one considers the fly population of India and the construction and sanitation of the lines and stables of the various Army Units and breeding studs, but more so of the civilian population, and the opportunities thus afforded for the spread of any disease from manure in which the fly is likely to act as a carrier, it is quite obvious that Habronemiasis is likely to be responsible for many, if not most, of the chronic cases of debility which must annually cost the Army and the country very large sums of money. Add "Habronemic Granuloma" (Bursatee) and "Habronemic Conjunctivitis," and the importance of the prevention and eradication of this all too often unrecognised condition is at once evident.

Prevention.—Eradication of flies as far as possible, thorough cleanliness and strict sanitation as regards manure are the essentials. There are various methods for dealing with manure. Robaud's

method, *i.e.*, burying the fresh dung daily inside a heap of fermenting manure and thus destroying the larvæ of the *Habronema* and the fly maggot, is probably the most simple. However, that is a point that can best be decided by the authorities concerned.

The early isolation of all debility cases, thorough destruction of the excreta when possible, and dosage with a reliable vermifuge (*see* treatment) should be insisted upon as a routine measure.

Treatment.—The work of Maurice Hall and others has shown the great value of *Ol. chenopodii* as a vermifuge. This drug, either alone or in conjunction with chloroform, followed by linseed oil and turpentine, might be tried with advantage.

It should prove efficient against *H. Muscæ* and *H. Microstoma*, and it might be effective against *H. Megastoma*. Carbon bisulphide whose value as an anti-bot agent has been recognised for years, also strikes one as being a suitable drug to try. Van Sacegham regards the destruction of the *Habronema* in the stomach as the ideal preventive measure against summer sores, arsenic up to 2 grains per diem being recommended.

His method of curative treatment for summer sores is as follows :— Disinfect the sore thoroughly and then apply the following :—

Plaster of Paris	100
Alum	20
Naphthalene	10
Quinine	10

This rapidly dries the sore, prevents the attack of flies and prevents the animal biting itself. He regards it as a specific.

In conclusion, the writer would draw attention to the necessity for careful post-mortems on all debility cases, as it is comparatively easy to overlook the presence of these minute worms, more especially *H. Muscæ* and *H. Microstoma*.

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GASTRIC LAVAGE SALINE TREATMENT IN CASES OF DEBILITY, ETC., BY MEANS OF THE SINGLE STOMACH TUBE.

By MAJOR H. ALLEN, R.A.V.C.
(*Saharanpur, India.*)

THE principles on which the treatment is based are as follows :—

Sodium chloride stimulates and increases secretion of the digestive fluids, furnishes hydrochloric acid for the gastric juice and soda salts for the bile ; in other words, it increases all glandular secretions and circulations of the fluids of the body, and prevents digestive troubles.

It assists in the assimilation of nutritive matters.

It is restorative, stomachic, antiseptic and cathartic.

It is the essential part of the animal fluids and solids.

It promotes excretion of fluid and waste materials.

Large doses of sodium chlorides enable the body to lose correspondingly large amounts of potassium. When the weight of the body increases, the excretion of potassium is likely to increase also. The more there is of potassium the larger is the breaking up of sugar and starches, so there is a decrease in tendency to form fat, and therefore to gain weight. There is no increased loss of sodium when the body gains weight. Vegetable diet provides much more potassium than soda salts, therefore the addition of salt to the diet is necessary for herbivora. Four-fifths of the total amount of salts in the body are a compound of phosphoric acid and lime ; one-fifth consists of potash, soda, iron, chlorine, magnesia, etc. In quantity potash and soda come next to lime and phosphoric acid. Sodium is required for digestion in the duodenum, as alkalinity is necessary. The blood can only carry off carbon dioxide when alkaline. Sodium chloride is therefore needed.

Excessive consumption of salt is said to increase greatly the amount of water excreted in the urine.

It is most important to supply sufficient drinking water during the course of treatment, as otherwise the proportion of water in the body will be lowered by the increased loss through the kidneys, thus leading to greater waste of protein.

Mineral salts are said to control life processes, and so their amounts should be kept normal in the blood, otherwise serious consequences will follow. The kidneys keep up the equilibrium of the mineral contents of the blood by excreting any excess ; but they may not be able to keep the blood normal if the food continues to furnish the blood with a disproportionate amount of salt mixture.

The trend of my argument is that a horse, in a debilitated state, is more or less suffering from a form of mineral poisoning owing to an unbalanced state of mineral matter in the composition of his body, and that the saline treatment rectifies matters.

Appended are a few cases of a series of experiments carried out on "Debility" subjects :—

Eight ounces of common salt in two gallons of water was pumped into the stomach for ten days, and repeated after an interval of a week if no decided improvement was noticed.

As a rule, a shine in the coat is evident after about three days' treatment ; the bowels are loosened in about two or three days, and become normal in another six days. I have never yet had a case of super-purgation.

All cases were weighed before starting the treatment, and re-weighed at intervals afterwards. Some of the experimental cases lost weight at the start of the treatment, evidently due to the excessive thirst causing de-gradation of albumen and the production of urea, owing to the digestive secretions being too dilute, and increased metabolism of the food.

In this connection it is of interest to note that horses in health, and under normal conditions, if allowed to drink as much water as they like, take, for one part of dry matter in the food, two to three parts of water. The external temperature has, of course, a great influence on the quantity, as the heat of the body is lowered in the summer by evaporation of water from the skin. Naturally, in cold weather the evaporation is much reduced.

I have had excellent results in combining linseed oil with common salt in cases of dyspepsia, impaction and sand colic. Three days' treatment, as a rule, cures digestive diarrhœa.

I have found the stomach tube very useful in cases requiring forcible feeding.

Recently imported Walers often go completely off their feed and water during the summer months in this country, and the stomach tube proves itself a godsend.

Combination of salt solution and formalin in treatment of canker cases has given me negative results.

Serial No. of Case.	Treatment started.	Weight before Treatment.		Weight after Treatment.		Result.		Remarks.
		Date.	Weight, lbs.	Date.	Weight, lbs.	Inc., lbs.	Dec., lbs.	
1	22/2/21	22/2/21	820	Evening 28/2/21	866	46	...	Had been in very poor condition since June, 1920. Fair condition March and April, 1921. Now in good condition.
				Morning 29/2/21	862	42	...	
				9/3/21	868	48	...	
				16/3/21	854	34	...	
				30/4/21	890	70	...	
				21/5/21	890	70	...	
				27/5/21	890	70	...	

Serial No. of Case.	Treatment started.	Weight before Treatment.		Weight after Treatment.		Result.		Remarks.
		Date.	Weight, lbs.	Date.	Weight, lbs.	Inc., lbs.	Dec., lbs.	
2	22/2/21	22/2/21	1098	28/2/21	1110	12	...	Condition very poor.
				8/3/21	1068	...	30	A very weak constitutioned horse, frequently suffered from diarrhœa. Always suspected "Strangylosis" being the chief cause of his condition. Had received frequent intravenous injections of atoyxl and normal saline solution without any appreciable result. Eventually "cast."
				15/3/21	1064	...	34	
3	24/2/21	24/2/21	1080	2/3/21	1096	16	...	Condition fair. Still under treatment.
				10/3/21	1116	36	...	
				13/3/21	1140	60	...	
				17/3/21	1100	20	...	
				27/5/21	1120	40	...	
4	24/2/21	24/2/21	1060	2/3/21	1112	52	...	Condition fair. At present suffering from skin disease (*Lichen Tropicus*).
				10/3/21	1138	78	...	
				13/3/21	1160	100	...	
				17/3/21	1140	80	...	
				27/5/21	1130	70	...	
5	23/2/21	23/2/21	894	2/3/21	895	1	...	Arrived in January, 1921, in poor condition. Now in fairly good condition, but requires more muscle on back and quarters, which he is putting on rapidly, with long, slow work.
				10/3/21	922	28	...	
				14/3/21	960	66	...	
				18/3/21	984	90	...	
				9/4/21	985	91	...	
				2/5/21	996	102	...	
				23/5/21	986	92	...	
				27/5/21	987	93	...	
6	19/2/21	19/2/21	988	5/3/21	970	...	18	Has been in very poor condition since October, 1920. Now carrying a healthier coat.
				16/3/21	936	...	52	
				27/5/21	938	...	50	
7	20/2/21	20/2/21	940	5/3/21	926	...	14	Starting to improve.
				16/3/21	910	...	30	
				27/5/21	912	...	28	
8	20/2/21	20/2/21	936	5/3/21	960	24	...	Arrived April, 1920, in poor condition. February, 1921, condition fair. Now in good condition. A horse with a weak constitution.
				16/3/21	976	40	...	
				30/4/21	976	40	...	
				23/5/21	992	56	...	
9	20/2/21	20/2/21	1066	5/3/21	1080	14	...	Starting to improve.
				16/3/21	1074	8	...	
				27/5/21	1074	8	...	
10	9/3/21	9/3/21	1092	15/3/21	1132	40	...	Issued to service.
				28/3/21	1120	28	...	
				5/3/21	1132	40	...	
11	9/3/21	9/3/21	890	15/3/21	890	...	...	Still under treatment.
				28/3/21	880	...	10	Has been "poor" since January, 1921
				8/4/21	894	4	...	
				27/5/21	897	7	...	Now in fair condition.

Serial No. of Case.	Treatment started.	Weight before Treatment.		Weight after Treatment.		Result.		Remarks.
		Date.	Weight, lbs.	Date.	Weight, lbs.	Ins., lbs.	Dec., lbs.	
12	9/3/21	9/3/21	808	15/3/21	812	4	...	
				28/3/21	808	...	...	
				5/4/21	808	...	...	
13	9/3/21	9/3/21	984	15/3/21	992	8	...	Still under treatment.
				28/3/21	960	...	24	
				5/4/21	996	12	...	
				27/5/21	984	...	...	
14	11/3/21	11/3/21	808	19/3/21	810	2	...	Still under treatment.
				28/3/21	840	32	...	Improving rapidly.
				5/4/21	852	44	...	
				27/5/21	880	72	...	
15	18/3/21	18/3/21	910	28/3/21	930	20	...	Still under treatment.
				27/5/21	972	62	...	
16	28/3/21	28/3/21	1046	5/4/21	1136	90	...	Still under treatment.
				27/5/21	1142	96	...	

HYDROPS AMNII.

By W. R. DAVIS, M.R.C.V.S.,
Enfield.

In June last I was called to a cow seven months' gone in calf, and found the animal to be tympanitic and showing a good deal of distress. There was considerable swelling in both flanks, particularly marked on the right side, where the skin over the swelling was very tense. I gave a draught containing turpentine and oil of peppermint, and went off to another case, returning in about an hour.

As the medicine had afforded no relief I punctured the rumen and let out a fair amount of gas, but the swelling did not go down, as it usually does after tapping, and was still present on the right side. I could feel the rumen actively moving while I held the cannula, and now, as no more gas was passing, I again inserted the trocar. The cannula must have slipped out of the rumen, because, when the trocar was pushed home, I felt it go through a resisting structure, and when the trocar was withdrawn, instead of gas, a straw-coloured fluid gushed out and I knew that the cannula was in the uterus. The instrument was left in position with the fluid pouring out.

In the afternoon I again saw the cow, and informed the owner that she was not going to do any good, and he at once sent for the butcher. There were two calves in the uterus, which was dilated, the walls being attenuated and pale. The fœtal membranes appeared to be friable and thinner than usual. The quantity of fluid was enormous—20 gallons at least.

There was nothing in the cow's appearance when first seen that might suggest one had to deal with anything but a tympanitic rumen. The belly was not pendulous, and the cow was in very good condition.

I have previously inserted a large sound through the *os uteri* and drawn the fluid off to relieve this condition. The calf is always born

dead, but the cow may do well. It is well, before puncturing pregnant cows for tympany, to make sure that hydrops of the membranes is not present. Probably this affection is the cause of the tympany.

A CONTRIBUTION TO THE STUDY OF TUMOURS OF THE DOMESTIC FOWL.

By B. F. KAUPP, V.S.

From the Laboratory of Poultry Pathology, North Carolina Experiment Station, State College Station, Raleigh, N.C.

A Compound Tumour of a Golden Wyandotte Cock.

While simple tumours, that is, tumours of but one kind of tissue, are the prevailing kind in both benign and malignant types, yet it is not unusual to find tumours made up of two or more kinds of tumour tissue. The tumour cells always resemble some normal body cell or cells either in adult or in embryonic formation.

A Golden Wyandotte cock, two years old and a member of the breeding birds of the Station Poultry Plant, died on April 15, 1921, and was sent to the laboratory for post-mortem. The cock had failed to fertilise the eggs of the hens with which he was mated, but his appetite and general appearance remained good, and no serious physical condition was noted till shortly before death.

Upon opening the abdominal cavity there was noted about 100 cc. of a straw-coloured fluid, and a very large tumour, involving the right abdominal air sac. There was also a small tumour on the left lobe of the liver. This is one of the most unusual tumours, both in size and in general tumour make-up, that we have ever studied. The tumour was placed in a 10 per cent. solution of formaldehyde and several days later was sectioned. The tumour measured $15 \times 10 \times 9$ cm., and the sectioned surface indicated a compound tumour, which later was confirmed by microscopic study. Islands of bone surrounded by hyaline cartilage were observed, and can be detected microscopically as pointed out in the photograph (marked 1). Fatty areas were also present, and shown at the place marked 2. Cysts, pointed out at number 4, are also observed. These cysts vary in size up to 13 mm. in diameter and contain a gelatinous substance more or less the colour of serum. Here and there are whitish areas, indicated by 3, which may possibly contain more or less connective tissue and cellular substance. At No. 5 will be noted an aneurism, which plainly shows the coagulated blood laid down in layers. It will be seen that the whole tumour section lacks uniformity in appearance, looking as though there were many kinds of tissue making up the whole tumour. Surrounding the whole tumour there is a thin fibrous capsule.

Microscopic Study.—After hardening blocks of the tumour tissue in formalin, dehydrating first in alcohol, then alcohol and ether, and

embedding in paraloid, sections were made and stained in hematoxylon and eosin, and clarified in beechwood creosote.

Adenomatous and Cystomatous Areas.—Here and there throughout the tumour, shown at 3, are areas in which has developed typical gland tissue. These glands vary in size from microscopic to 13 mm. in diameter. In the smaller glands their cavities are lined with cuboidal cells, and as the size of the glands increases the lining cells become higher, till high columnar cells are observed. One of the very largest cysts is seen at 4.

Cartilaginous and Osseous Areas.—Parts of the tumour show typical hyaline cartilage, and in many instances the central core of these parts has become calcified into true bone (No. 1).

FIG. 1.—Cysto-Lipo-Chondro-Osteo-Adeno-Carcinomata of a Golden Wyandotte Cock. 1, Cartilage and bony area; 2, fatty tissue; 3, adenomatous and carcinomatous zone; 4, cysts; 5, aneurism.

Carcinomatous Areas.—Some of these parts (pointed out at No. 3) show cavities filled with adult type epithelial cells, and these masses are surrounded by adult type connective tissue. These are areas of true carcinoma. Carcinoma we have found to be quite rare in the domestic fowl—in fact, this is the first true carcinomatous tissue we have observed, though epitheliomas of the skin structure we have frequently seen.

Lipomatous Areas.—Areas, as pointed out at 2, are made up of fatty tissue.

Microscopic Diagnosis.—Cysto-Lipo-Chondro-Osteo-Adeno-Carcinomata.

LYMPHO-SARCOMA OF A SINGLE COMB WHITE LEGHORN COCK.

The subject of this study is a three-year-old Single Comb White Leghorn cock, No. 1014, a grandson of the Baron hen who won first in the International Egg-Laying Contest at Mountain Grove, Missouri. This cock was hatched in the spring of 1917. He was used in the breeding pens of the station for three consecutive years. In October, 1920, it was noticed that the bird had developed a tumour on the right forearm. This tumour was removed on October 8, and the wound was painted with pure tincture of iodine. The tumour measured 4×1·5 cm. Cultures were made from the tumour that was removed,

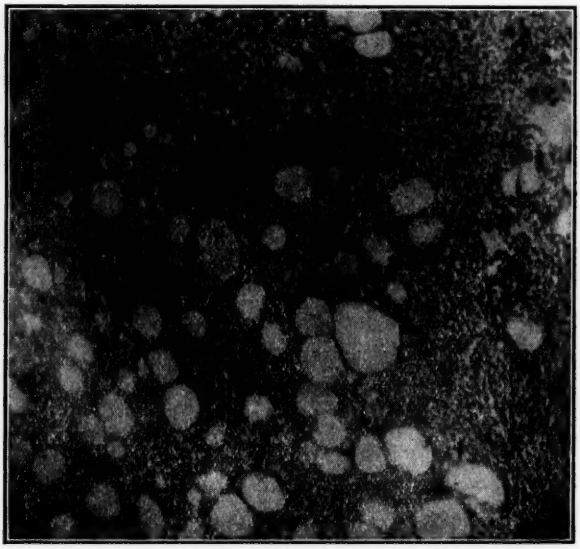


FIG. 2.—Lympho-Sarcoma of a White Leghorn Cock.

thinking possibly we were dealing with an infection. A rabbit was also inoculated from an emulsion of the tumour. An abscess developed at the point of inoculation. Later, an examination showed that the tumour was recurring, and on the 14th three other tumours were removed from the upper cervical region. These tumours were confined to the skin and measured 1×0·75 cm. in diameter. Upon cutting the tissue, it appeared like sarcomatous tissue, although at that time no sections were made for study. The bird died on November 10, 1920.

Post-Mortem.—Upon opening the abdominal cavity, there was found partially coagulated serum amounting to about 25 cc. The

liver is in a state of chronic inflammation. The kidneys are pale, and show evidence of a state of cloudy swelling. In the cæcal wall there are observed four tumours about 1 cm. in diameter. There is a tumour of the mesentery measuring 2·5×3 cm. There are eighteen tumours of the skin.

A microscopic study of sections of various tumours showed a round, celled lympho-sarcoma.

MYXO-SARCOMA OF A BARRED PLYMOUTH ROCK HEN.

Sarcomas are malignant tumours formed on the type of connective tissue, but they are, as a rule, largely composed of cells ; the basement

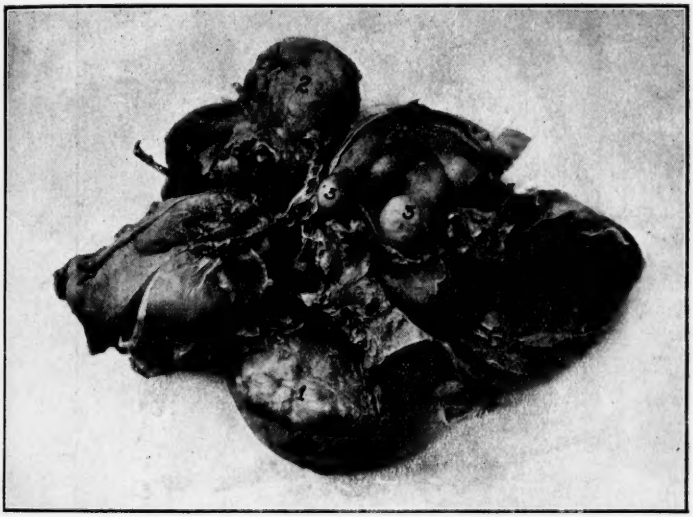


FIG. 3.—Myxo-Sarcoma of a Barred Plymouth Rock hen. 1, 2, and 3 are tumours of the liver ; 4, are small tumours developing in the liver substance ; 5, are two small tumours of the pericardium at the apex of the heart.

substance, though a constant and important factor, being much less conspicuous than in adult connective tissue. They closely resemble, in general, the developing connective tissue of the embryo or granulation tissue of inflammation.

The cells of sarcoma may be varied in size and shape. They may be flat, fusiform, spheroidal, or branched, and even cuboidal or cylindrical ; they may be multinuclear and very large, or they may be small and spheroidal, resembling leucocytes. The fibrillar basement substance may be present in such small quantities as entirely to escape a superficial observation, covered as it may be by the abundant cells,

or it may be so abundant as to give the tumour the general appearance of a fibrona.

Mucous degeneration is frequent in the various forms of sarcoma. A combination of myxoma and sarcoma, myxo-sarcoma, is common in animals and in man. The present case is the first case we have studied in the domestic fowl.

A Barred Plymouth Rock hen three years old, in feeding experimental work, is the subject of this discussion. This hen appeared in excellent health till a very short time before death.

Post-mortem.—Upon opening the abdominal cavity, numerous

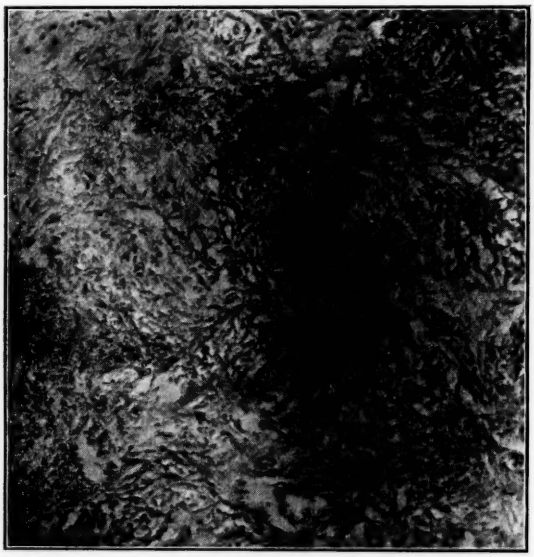


FIG. 4.—A photomicrograph of a section of one of the tumours shown in Fig. 3, showing myxomatous area. Note the spindle and stellate cells.

round white tumours were observed involving the viscera. No. 1 shows a tumour which measures $38 \times 30 \times 23$ mm.; this tumour is attached to the under side of the right lobe of the liver. No. 2 is the second largest tumour, and measures $28 \times 22 \times 15$ mm., and is attached to the anterior and inner part of the right liver lobe. There are several, twenty or more, smaller tumours as illustrated by No. 3. These tumours varied from 10 to 15 mm. in diameter. In addition, there were still smaller tumours embedded in the liver substance as illustrated at No. 4, and these measured from 1 to 4 mm. in diameter. In addition to this, tumours were distributed over other organs, there

being three involving the pericardium at the base of the heart, and two of the same membrane near the apex, as shown by No. 5.

The balance of the organs are apparently in a normal state.

Sections were studied from various of the tumours.

The tumour consists of various types of cells. It is composed largely of cells ; most areas show nothing else. Here and there throughout the tumour may be seen very small groups of adult connective tissue, cells with very long, slender nuclei, but the major part of the tumours are made up of large spindle cells lying in bundles, and areas cut crosswise appear on transverse section, with large nuclei, with a small amount of cytoplasm surrounding the nuclei. Another type cell is observed, one that is often observed in sarcomas. This is a very large cell, with sometimes one, and at other times two large, irregular-shaped nuclei. In fact, these cells are giant in size.

In some areas there appears myxoid degeneration. Fig. 4 brings out the appearance of one of the myxomatous areas. In this picture can be seen the spindle and the stellate cells, with only a moderate amount of basement substance. The basement substance is of a homogeneous nature. These areas represent typical mucous tissue.

AN INTERESTING TUBERCULOUS SPLEEN.

By FRANK CHAMBERS, O.B.E., F.R.C.V.S.,
Wolverhampton.

THE subject was a seven-year-old bull-dog, which had been ailing for twelve months. He was very emaciated, abdomen distended, and showed no inclination to move or take any interest in life. The owner stated that he would improve tremendously for a few weeks, and would eat well, only to relapse into his usual lethargic state. The post pharangeal glands were enlarged, and a large spleen could be felt quite easily. I diagnosed tuberculosis and advised destruction.

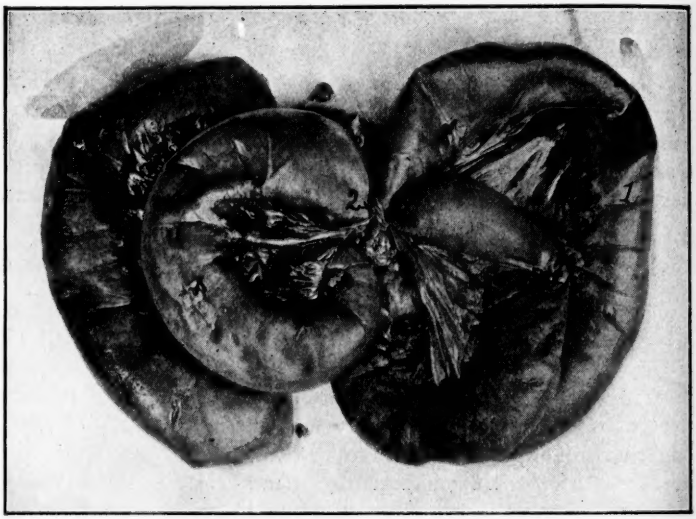
Autopsy revealed a very much enlarged spleen, measuring 16 inches long and 5 inches wide at its greatest width. The weight was 3 lbs. 2½ ozs., and contained numerous tubercular foci in the different stages of casention, etc. The intestines, liver and kidneys were normal. Lungs normal, but the post-pharangeal glands were infected and very much enlarged.

VOLVULUS OF THE FREE PORTION OF THE SMALL INTESTINES OF THE HEN.

By B. F. KAUPP.
From the Poultry Pathological Research Laboratory, N.C. Experiment Station, State College Station, Raleigh, N.C.

WHILE volvulus, or twisted bowel, is extremely rare in the bird, it is often observed in mammals. The writer has observed it in autopsies of horses dead of colic. Volvulus also occurs in the cow, where the symptoms are also those of enteritis and obstinate constipation.

History.—A Single Comb Rhode Island Red hen, one year old, which had just died, was brought to the laboratory for diagnosis.



Two or three hens had died, and it was feared that cholera had attacked the flock. An autopsy was held for the purpose of determining the cause of death. All organs were normal except the condition to be described in the intestines.

Volvulus was observed in the free portion of the small intestine. The figure shows four loops of the small intestine, inflated to some extent by gas, and showing intense passive congestion, the intestine being black in colour. At 2 will be seen a part of the free portion of the small intestine, which, passing through a rupture of the mesentery, has tightly tied and strangulated this portion, stopping all circulation, and causing passive congestion, thus leading to death of the strangulated part.

Obituary

We were sorry to learn of the death of Mr. Duncan M'Naught Gardner, M.R.C.V.S., which took place at his residence, Springvale, Helensburgh, on Tuesday, September 6.

Born at Overton Farm, Alexandria—a "son of the soil"—he entered the Glasgow Veterinary College, then situated in Parliamentary Road, and under the late Principal M'Call, in April, 1873, gained his diploma, and was admitted a member of the Royal College of Veterinary Surgeons. Proceeding to Helensburgh, the same year he set up practice, and later opened business as a grain merchant, which formed one of the most extensive connections in the West of Scotland. He was for over forty years Veterinary Inspector under the Diseases of Animals Act for the Eastern Division of Dumbartonshire, and only resigned a few years ago owing to ill-health. Mr. Gardner was a good judge of a cart horse, and owned many first-class driving hacks. His figure was a familiar one for many years on the road and at cattle shows in the West, where he was often asked to judge light-footed horses.

Mr. Gardner was seventy-three years of age and is survived by a wife, one daughter, and seven sons, six of whom served with the colours as combatants overseas in various fronts in the great war, and, though two of them were severely wounded, all survived. The sympathy of a very wide circle of friends will be extended to Mrs. Gardner and her family.

Review.

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THIS is a handy little book of 191 pages with an index. It is one which will be of great service to the veterinary practitioner, as the arrangement of the matter is quite plain and so divided up that it is quickly accessible for reference. The high standard that the firm has always aimed at in the manufacture and production of its therapeutical agents is well known, and practitioners feel from experience that they are safe and up-to-date when employing the healing and preventive preparations of the house. Serums, bacterins, vaccines and organic products have good descriptive sections. Biological therapy and hypodermic medication receive full consideration and antiseptics, and germicides are amply dealt with. The Colonial practitioner will welcome a section on "Diseases of Camels."

Equipped with this book and a fair number of the products described therein and supplied by the firm the veterinary practitioner will be well able to deal effectively with most of the cases he comes across each year. We commend the firm for producing such an excellent little work and we advise all practitioners to apply for a copy.

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